

Internal Research Fellow (PostDoc) in Lunar Surface Operations Preparation

Job Req ID: 12464

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Vacancy Type: Internal Research Fellow

Date Posted: 26 April 2021

Research Fellowship Opportunity in the Directorate of Operations.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. For this purpose, we welcome applications from all qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, age, disability or other characteristics. Applications from women are encouraged.

This post is classified F2.

Location

ESOC, Darmstadt, Germany

Our team and mission

The Internal Research Fellow will be supported by several sections in the Directorate of Operations:

- Mission Operations Definition Unit, Solar System & Exploration Missions Division, Mission Operations Department
- Mission Analysis Section, Flight Dynamics Division, Ground Systems Engineering & Innovation Department
- Application & Robotics Data Systems Section, Mission Operations Data Systems Division, Ground Systems Engineering & Innovation Department

The Mission Operations Definition Unit in the Solar System & Exploration Missions Division is responsible for definition phase activities in the field of mission operations for future ESA missions. One of these activities is preparation for future robotic missions to the Moon and Mars.

The Mission Analysis Section is entrusted with mission studies for future terrestrial, lunar and interplanetary missions as well as scientific missions located in planetary or lunar libration points with emphasis on trajectory and attitude related aspects, and on supporting ground segment design and operations. The task also includes development of the necessary analytical and numerical methods and software tools.

The Applications & Robotics Data Systems Section belongs to the Mission Operations Data Systems Division and is responsible for the data systems engineering and support activities required for operations of Applications & Robotics missions. This includes development and maintenance, sustaining and evolution of mission data systems for all relevant assets of the ESA programmes in the Space Safety Program, Navigation, Telecommunications, Human and Robotics and Space Transportation Directorates and 3rd party projects. The Section is very active in undertaking studies, technology development activities, pre-development and in-orbit demonstration on related fields to bring innovation in data systems to the benefit of missions/projects, promoting the adoption of innovative concepts, technologies and standards. Examples of novel technologies developed in the Section are Artificial Intelligence, Virtual and Augmented Reality, Cybersecurity and Model Based Systems Engineering.

Interested candidates are encouraged to visit the ESA website: www.esa.int

Field(s) of activity/research for the traineeship

With Europe's ambition for sustainable lunar exploration, supporting surface landing of probes and surface operations of rovers equipped with multiple instruments (cameras, drillers, arms, e.t.c) is becoming more relevant. In preparation of such types of operations, having an accurate Digital Terrain Model (DTM) of the surface can be of critical importance both for the initial assessment of the landing sites, operations preparation and execution of the mission. Considering existing European systems for terrain modelling, we will work on building up Digital Terrain Models suitable for our surface operations needs from the images available, e.g. from orbiters, which can be performed using multi-view Artificial Intelligence (AI) Computer Vision methods on the available datasets (e.g. GANs). Once we have more details on the terrain, we can commence with the AI based traversability planning between the starting point (e.g. landing site) and the destination (e.g. scientifically interesting site or cargo delivery site). In this type of planning, a wide range of constraints need to be taken into account, such as terrain soil, rover characteristics, etc. with the objectives being to optimise the mission return by e.g. maximising the number of interesting sites visited.

Technical competencies

Knowledge relevant to the field of research

Research/publication record

Ability to conduct research autonomously

Breadth of exposure coming from past and/or current research/activities

General interest in space and space research

Ability to gather and share relevant information

Behavioural competencies

Result Orientation

Operational Efficiency

Fostering Cooperation

Relationship Management

Continuous Improvement

Forward Thinking

Education

You should have recently completed, or be close to completion of a PhD in a related technical or scientific discipline. Preference will be given to applications submitted by candidates within five years of receiving their PhD.

A PhD in one or more related technical or scientific disciplines is required.

Additional requirements

The working languages of the Agency are English and French. A good knowledge of one of these is required. Knowledge of another Member State language would be an asset.

Other information

For behavioural competencies expected from ESA staff in general, please refer to the [ESA Competency Framework](#).

The Agency may require applicants to undergo selection tests.

In addition to your CV and your motivation letter, please add your proposal of no more than 5 pages outlining your proposed research in the "additional documents" field of the "application information" section.

At the Agency we value diversity and we welcome people with disabilities. Whenever possible, we seek to accommodate individuals with disabilities by providing the necessary support at the workplace. The Human Resources Department can also provide assistance during the recruitment process. If you would like to discuss this further please contact us at contact.human.resources@esa.int.

Please note that applications are only considered from nationals of one of the following States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, and the United Kingdom. Nationals from Latvia and Slovenia, as Associate Member States, or Canada as a Cooperating State, can apply as well as those from Bulgaria, Cyprus, Lithuania and Slovakia as European Cooperating States (ECS).

Priority will first be given to candidates from under-represented Member States.

In accordance with the European Space Agency's security procedures and as part of the selection process, successful candidates will be required to undergo basic screening before appointment